of 110-190 can be stored on a tangible storage medium and can include software instructions which can be executed to perform the functionality described herein.

[0022] Revenue management problem data can be communicated from external interface 110 to data manager 120. Data manager 120 can include mapping software program 121 and database 123 for storing the data. When revenue management problem data is received by data manager 120 from external interface 110, mapping software program 121 can map the revenue management problem data to database 123. More particularly, mapping software program 121 can map the revenue management problem data to database 123 in the format of generic revenue management data model 125. Generic revenue management data model 125, which will be discussed in greater detail in conjunction with Figure 2, allows data for multifarious revenue management problems to be expressed in a uniform format.

[0023] In an alternative embodiment, rather than mapping data to database 123, mapping software program 121 maps revenue management problem data to memory 127 according to generic revenue management data model 125. In this embodiment, data manipulation and mapping can both be performed in memory 127. At the end of all optimization steps, the solutions and/or revenue management problem data can be written to database 123 and communicated to a user through external interface 110.

[0024] Whereas revenue management problem data can be communicated to data manger 120, scheduling information can be passed to scheduler 130. Scheduler 130, based on the scheduling information, can determine the sequence in which solvers 140, 150 and 160 should apply optimization algorithms to the revenue management problem data stored in generic revenue management data model 125. It should be understood that any number of "solver" programs can be used in conjunction with the present invention. These solvers can apply revenue management algorithms to the revenue management problem data in order to achieve optimal decision rules. As an example, solver 140 might take the data from generic revenue management data model 125, derive an optimal solution for the network, and return the network-wide solution to data manager 120. Solver 150 could then decompose the network to determine how the network optimization solution affects local resources. After the network has been decomposed, solver 160 might apply an algorithm to the data in generic revenue management data model 125 to derive locally optimal solutions. When a particular solver applies an algorithm to the data stored in generic revenue management data model 125,

mapping software program 121 can map the results to database 123 and/or generic revenue management data model 125. Thus, at any given time, generic revenue management data model 125 can include, among other potential data, problem definitions, intermediate calculations and/or optimal revenue management values.

[0025] FIGURE 2 is a diagrammatic representation of generic revenue management data model 125, which can be used to organize revenue management problem data. To aid in a better understanding of generic revenue management data model 125, several terms and concepts shall be explained. For example, "Resources" can be the discrete items that a company offers to satisfy a demand. A resource can have as an attribute a capacity value that measures the ability of the resource to contribute to the satisfaction of a demand. In the case of the airline industry, for example, a resource could be a seat in the economy class of a plane for a flight leg (a leg is the flight between two airports, not necessarily between an origin and the ultimate destination).

[0026] "Demand" can be the demand placed on a network for a particular item or combination of items. Again, using the airline industry an example, a "demand" might be the demand for a flight from Austin, Texas to Washington, D.C. Because this itinerary might involve changing planes at an intermediate airport (e.g., Atlanta) the demand may not be directly linked to individual resources. Generally, the demands on a network can be estimated using a demand function. Thus, the demand might not represent an actual demand (e.g., actual ticket purchases), but could be a forecasted demand. In terms of Figure 1, the demands could, in one embodiment, be provided by forecaster 170. Along with the forecasted demand, a demand can also include the accumulation or diminishment of actual demands. For example, in the airline industry, a demand might account for actual tickets purchased and actual cancellations.

[0027] While resources are the discrete items offered to satisfy a demand, a "resource bundle" can be a set of resources that are combined to form a product or service. In some cases, a resource bundle can be associated with a single resource (e.g., a seat on a direct flight from Austin to Dallas can be both a resource and a resource bundle). In other cases, a resource bundle can be associated with multiple resources (e.g., a resource bundle of a seat on a flight from Austin to Washington, D.C. can include an Austin to Atlanta flight and an Atlanta to Washington, D.C. flight). Resource bundles are generally defined externally to optimization

engine 100. For example, an airline can predetermine which resource bundles offer a reasonable a transportation service.

[0028] A "resource bundle to demand link" can associate the resource bundles with the demands that each resource bundle satisfies. The resource bundle to demand links can exist based on the relationships that exist internally to the network. For example, if a passenger wished to fly from point A point D, an airline might offer several resource bundles that satisfy that demand. These might include a direct point A to point D flight (A-D), a point B to point A to point D itinerary (B-A-D) or a point A to point C to point D itinerary (A-C-D). Each of these resource bundles could satisfy a passengers demand to fly from point A to point C to point D (A-C-D), and can thus be linked to that demand.

[0029] Generic revenue management data model 125 can be used to represent revenue management data using several data structures. Generic revenue management data model 125 can include a demand data structure 200, which can contain a representation of a set of network demands. Demand data structure 200 can be used to enumerate all the different demand types that a network is experiencing or any subset thereof. For an airline, demand data structure 200 could contain a representation all the demands for various flights, at different prices (i.e., "fare classes"), experienced by the airline.

[0030] Along with demand data structure 200, generic revenue management data model 125 can include a resource data structure 210, which can contain a representation of a set of network resources. For an airline, this might include a representation of all the flight legs that an airline offers.

[0031] Generic revenue management data model 125 can further include a resource bundle data structure 220 that can contain a representation of a set of resource bundles. It should be recalled that a resource bundle could be a group of resources that are combined to form a product or service. Again, using the example of an airline, a resource bundle data structure could contain a representation of all the itineraries that an airline offers.

[0032] Resource bundle data structure 220 can be associated with demand data structure 200 through resource bundle to demand link data structure 230. Resource bundle to demand link data structure 200 can contain a representation of the associations between the